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Letter to the Editor

Pulmonary Artery Pressure Monitoring during the COVID-19 Pandemic in New York City

To the Editor:

Almufleh et al¹ describe the impact of the Coronavirus disease 2019 (COVID-19) pandemic on 21 patients with heart failure (HF) monitored by the implantable CardioMEMS-3 system in Massachusetts before and after March 11, 2020, when a state of emergency was declared. Pulmonary artery pressure volatility in the post COVID-19 period increased, with a higher frequency of patients crossing pulmonary artery diastolic thresholds but a concomitant increase in clinician calls and interventions and a reduction in hospitalizations because of HF. The authors conclude that effective remote

monitoring management was at least partly at play in preventing hospital admissions in this small cohort.

We also conducted a retrospective chart and remote-monitoring review of 49 patients with wireless implantable hemodynamic monitoring (W-IHM), of whom 40 were actively followed at our institution from February 1 to April 22 (pre-COVID-19 and during the COVID-19 period) in New York. The first confirmed case of COVID-19 in New York State (NYS) occurred on March 1. On March 22, the NYS on Pause Program went into effect with a statewide stay-at-home mandate including closure of nonessential businesses. It was during this time that NYS was the global epicenter of the COVID-19 pandemic. As of July 15, 2020, 404,775 patients had tested positive for COVID-19 in NYS, which represented the highest number of cases in the United States at that time.²

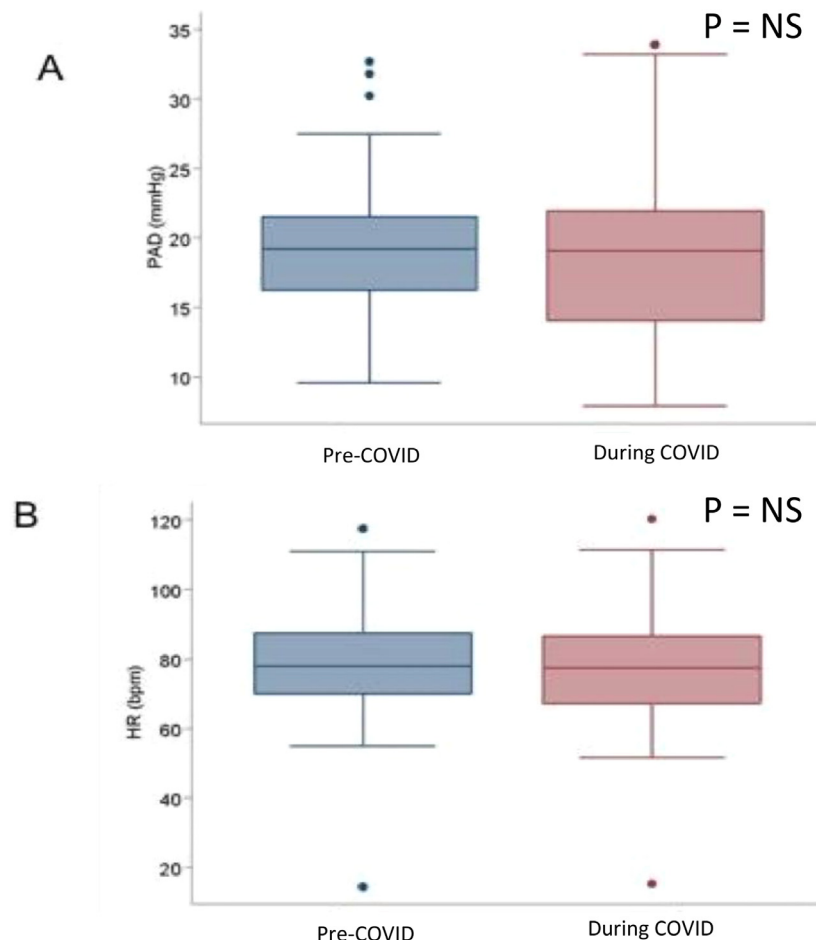


Fig. 1. (A, B) Trends in average pulmonary artery diastolic pressure and heart rate pre-COVID-19 (February 1, 2020 to February 29, 2020) and during COVID-19 (March 22, 2020, to April 22, 2020).

We, similarly, aimed to ascertain whether stay-at-home mandates would result in changes in pulmonary artery diastolic pressures among patients with HF and W-IHM. In our larger cohort, we made the following observations: (1) the rate of W-IHM transmissions by patients increased, as did the number of interventions by clinicians (phone calls, text messages and video encounters) during the pandemic; (2) there was no significant difference in the mean pulmonary artery diastolic pressures prior to and during COVID-19 (19.4 ± 5.6 mmHg and 18.9 ± 6.7 mmHg [$P=0.654$], respectively), nor was there a difference in the mean heart rate (79.9 ± 14.4 vs 78.9 ± 15.3 bpm [$P=0.8105$], respectively) (Fig. 1); (3) the number of hospitalizations due to HF was lower during the pandemic.

Patients transmitted readings at an average of 17.8 ± 9.1 times per month in the period pre-COVID 19 compared to 18.9 ± 9.9 times per month during COVID-19 ($P=0.526$). During the latter period, individuals had a range of 0–4 interventions in a month, and of those, 13 (32.5%) had an increase in diuretics, 8 (20%) had a decrease in diuretics, and 1 (2.5%) had a change in guideline-directed medical therapy. Similarly, during COVID-19, individuals had a range of 0–5 interventions in a month, and of those, 16 (40%) had an increase in diuretics, 7 (17.5%) had a decrease in diuretics, and 1 (2.5%) had a change in guideline-directed medical therapy.

Our study has limitations similar to those reported by Almufleh et al, in that generalizability is limited due to the small cohort size and retrospective study design.

Behavioral changes as a result of home isolation during the COVID-19 pandemic may be bidirectional. Increased anxiety may drive poor dietary choices. Conversely, a reduction in daily activity may decrease autonomic tone and result in increased medication compliance, daily weight monitoring and transmission of pulmonary artery pressure via W-IHM. As COVID-19 continues to spread and result in morbidity and mortality, reliance on remote monitoring is likely to increase. We agree with Almufleh et al that vigilant monitoring and, in

particular, management of remote monitoring devices may, at least in part, explain the decrease in hospitalizations due to HF despite patients' reluctance to seek medical care; however, we failed to find the initial pulmonary artery pressure volatility reported in Boston. More reports are needed to determine the effects of social changes inflicted by COVID-19 restrictions on congestion, compliance and outcomes in patients with HF and W-IHM.

Acknowledgments

Noah Moss, MD, Jesus Alvarez-Garcia, MD, Maya Barghash, MD, Christina Surach, NP, Vinh Chau, MD, Maria G Trivieri, MD, Aditya Parikh, MD, Johanna Contreras, MD, and Donna M. Mancini, MD.

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